

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Scott Malpede on February 2, 2009.

2. The application has been amended as follows:

In the claims:

Cancel Claims 1, 6, 9 and 13.

7. (Currently Amended) An image display apparatus according to claim [[6]] 12, wherein the modulation circuit increases a time width of a pulse waveform of the modulated signal by one unit time or a voltage amplitude value of a portion of the pulse waveform of the modulated signal by one unit voltage, when input data of the modulation circuit is increased by one unit.

8. (Currently Amended) An image display apparatus according to claim [[1]] 12, wherein the voltage drop compensation circuit calculates the corrected image data with respect to image data obtained by multiplying the image data by a gain of greater than 0 but not greater than 1, so that the corrected image is contained in an input range of the modulation circuit.

10. (Currently Amended) An image display apparatus ~~according to claim 7,~~
comprising:

electron-emitting devices driven in a matrix by a plurality of row wirings
and column wirings;

a scanning circuit for sequentially selecting and scanning the row wirings;
a modulation circuit generating a modulated signal by modulating both a
pulse width and a voltage amplitude, with the modulated signal being applied to the
column wirings; and

a voltage drop compensation circuit for calculating corrected image data
for reducing an influence of voltage drops due to at least resistance components of the
row wirings, with respect to image data, wherein

the voltage drop compensation circuit includes;
an effective voltage calculating circuit for finding an effective voltage value
on the basis of the image data, the effective voltage value being a value obtained by
averaging in a time direction a voltage amplitude value of the modulated signal
corresponding to the image data for one horizontal scanning period; and

a compensation value calculating circuit for calculating a compensation
value for reducing an influence of voltage drops due to at least resistance components
of the row wirings, with respect to the effective voltage value,
wherein the modulation circuit outputs a modulated signal on the basis of
the corrected image data,

wherein a pulse waveform of the modulated signal has a plurality of voltage amplitude values or one voltage amplitude value,

wherein the modulation circuit increases a time width of a pulse waveform of the modulated signal by one unit time or a voltage amplitude value of a portion of the pulse waveform of the modulated signal by one unit voltage, when input data of the modulation circuit is increased by one unit, and

wherein the voltage drop compensation circuit calculates the corrected image data with respect to image data obtained by multiplying the image data by a gain of greater than 0 but not greater than 1, so that the corrected image data is contained in an input range of the modulation circuit.

11. (Currently Amended) An image display apparatus according to claim [[1]] 10, wherein the modulation circuit outputs the modulated signal on the basis of limited range-corrected image data obtained by multiplying the corrected image data by a gain of greater than 0 but not greater than 1, so that the limited range-corrected image data is contained in an input range of the modulation circuit.

12. (Currently Amended) An image display apparatus according to claim 6, comprising:

electron-emitting devices driven in a matrix by a plurality of row wirings and column wirings;

a scanning circuit for sequentially selecting and scanning the row wirings;

a modulation circuit generating a modulated signal by modulating both a pulse width and a voltage amplitude, with the modulated signal being applied to the column wirings; and

a voltage drop compensation circuit for calculating corrected image data for reducing an influence of voltage drops due to at least resistance components of the row wirings, with respect to image data, wherein

the voltage drop compensation circuit includes:

an effective voltage calculating circuit for finding an effective voltage value on the basis of the image data, the effective voltage value being a value obtained by averaging in a time direction a voltage amplitude value of the modulated signal corresponding to the image data for one horizontal scanning period; and

a compensation value calculating circuit for calculating a compensation value for reducing an influence of voltage drops due to at least resistance components of the row wirings, with respect to the effective voltage value,

wherein the modulation circuit outputs a modulated signal on the basis of the corrected image data,

wherein a pulse waveform of the modulated signal has a plurality of voltage amplitude values or one voltage amplitude value, and

wherein the modulation circuit outputs the modulated signal on the basis of limited range-corrected image data obtained by multiplying the corrected image data by a gain of greater than 0 but not greater than 1, so that the limited range-corrected image data is contained in an input range of the modulation circuit.

Allowable Subject Matter

3. Claims 7-8,10-12 are allowed and renumbered as 1-5.
4. The following is an examiner's statement of reasons for allowance: The present invention related to a display apparatus in which voltage drops due to the wiring resistance is compensated by employing a modulation system using amplitude and pulse-width modulations. Each of the independent claims identifies the uniquely distinct feature:

As per claim 10,

wherein the modulation circuit increases a time width of a pulse waveform of the modulated signal by one unit time or a voltage amplitude value of a portion of the pulse waveform of the modulated signal by one unit voltage, when input data of the modulation circuit is increased by one unit, and

wherein the voltage drop compensation circuit calculates the corrected image data with respect to image data obtained by multiplying the image data by a gain of greater than 0 but not greater than 1, so that the corrected image data is contained in an input range of the modulation circuit.

As per claim 12,

wherein a pulse waveform of the modulated signal has a plurality of voltage amplitude values or one voltage amplitude value, and

wherein the modulation circuit outputs the modulated signal on the basis of limited range-corrected image data obtained by multiplying the corrected image data by a gain of greater than 0 but not greater than 1, so that the limited range-corrected image data is contained in an input range of the modulation circuit.

The closest prior art of Suzuki et al. (U.S Patent No. 5743,361) and Sarrasin et al. (U.S Patent No. 5,555,000) show similar systems, but either singularly or in combination, fail to anticipate or render above quoted limitations obvious.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUC Q. DINH whose telephone number is (571)272-7686. The examiner can normally be reached on Mon-Fri from 8:00.AM-4:00.PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, AMR A. AWAD can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2629

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duc Q Dinh/
Examiner, Art Unit 2629